



BADGER LABORATORIES & ENGINEERING INC.

501 WEST BELL STREET • NEENAH, WISCONSIN 54956-4868 • EST. 1966
(920) 729-1100 • FAX (920) 729-4945 • 1-800-776-7196

THILMANY, LLC
Boiler #7 Emission Test
at
Kaukauna, WI

December 6, 2011
Project #12-016A

Prepared by:

BADGER LABORATORIES & ENGINEERING
501 W Bell Street
Neenah, WI 54956

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Bruce F. Lamers
Project Manager

Jeffery M. Wagner
Chief Chemist

No. 7 Boiler Emission Results

12/06/11

<u>Test Run</u>	<u>Volumetric Flow Rate dscfm</u>	<u>Isokinetic Ratio, %</u>	<u>Particulate Emission</u>	
			<u>lb./hr.</u>	<u>lb./MM Btu</u>
1	53,575	98.2	26.62	0.162
2	52,304	98.4	23.26	0.147
3	51,013	99.7	30.33	0.217
<u>Average of 3 Runs</u>			<u>26.74</u>	<u>0.18</u>
<u>Sootblowing Emission Calculation</u>				<u>0.18*</u>
<u>Limitation</u>				<u>0.30</u>

* **0.18** = $0.162((0.133+0.867)*0.133/3.199)+0.182*((24-0.133)/24-(0.115/3.199))$

Sootblowing occurred during run number one for 8 minutes. There is one eight-minute Sootblowing period per day. Calculation based on NR 439.07(8)(b)

II. Process Description

Boiler #7

The stack carries exhaust gases from the #7 boiler. The boiler is a Babcox and Wilcox stoker with vibrating hydrograte. The boiler is rated at 90,000 lb./hr. steam at 600 psi and 205 million BTU per hour. The source is equipped with multi clones and a wet scrubber. The boiler is capable of burning bark, paper, tires, natural gas and #6 fuel oil. During the tests the boiler was fired with bark and paper pellets. The average load during the three runs was 91.2% of capacity. Sootblowing occurred during run number one for eight minutes.

The #7 boiler test data sheet supplied by Thilmany personnel is contained in the Appendix. Fuel samples were taken by Thilmany personnel and sent in for an Ultimate analysis to determine a Fd factor. The analyses are contained in the Appendix. The calculated Fd factors are shown below.

<u>Test Run</u>	<u>Fuel F Factor</u>
1	8,908 dscf/MM Btu
2	9,372 dscf/MM Btu
3	9,754 dscf/MM Btu

Location:
Date:

#7 Boiler
12/06/11

Time:	8:30	9:52	11:20
	9:32	10:54	12:22
Test Run	1	2	3

Average

STACK GAS DATA:

Temperature:	140.3	139.5	136.9	138.9
Velocity, ft/sec.	30.854	29.533	28.476	29.621
Gas Volume, acfm	70,820	67,788	65,363	67,990
Gas Volume, scfm (wet)	61,519	58,964	57,107	59,196
Gas Volume, scfm (dry)	53,575	52,304	51,013	52,297
Moisture, %	12.9	11.3	10.7	11.6
Carbon Dioxide, % (dry)	8.6	9.0	8.4	8.7
Oxygen, % (dry)	11.4	11.0	11.6	11.3
Nitrogen, % (dry)	80.0	80.0	80.0	80.0
Molecular Weight, (dry)	29.83	29.88	29.81	29.84
Molecular Weight, (wet)	28.30	28.54	28.55	28.46

SAMPLING DATA:

Total Time, min.	60	60	60
Volume, dscf	41.586	40.666	40.192
Isokinetic Ratio, %	98.2	98.4	99.7

PARTICULATE EMISSION RATES:

Fronthalf Particulate, mg	152.9	132.5	176.0	153.8
Emission Rate, Fronthalf lbs/hr.	26.0608	22.5467	29.5537	26.0537
Total Particulate Collected, mg	156.2	136.7	180.6	157.8
Concentration, grains/dscf	0.05784	0.05177	0.06920	0.05960
Concentration, lbs/dscf	8.282E-06	7.412E-06	9.908E-06	8.534E-06
Emission Rate, Total lbs/hr.	26.6232	23.2614	30.3262	26.7369
Emission Rate, lb/1000 lb Stack Gas	0.0982	0.0888	0.1195	0.1021
Fo Factor	1.105	1.100	1.107	1.104
Fd Factor	8908	9372	9754	9345
F Factor Emission Rate, lb/MM BTU	0.162	0.147	0.217	0.1754

Thilmany, LLC- Kaukauna Mill
No. 7 Boiler PM Emission Test--- December 6, 2011

Run number	Run start time	Run end time	Ave. Steam Flow, M LBS./HR	Ave. Multiclone dP, " WC	Ave. Scrubber dP, "WC	Ave. Scrubber Flow, GPM	Ave. Scrubber Water Pressure, PSIG
1	12/6/11 8:30	12/6/11 9:32	82.8	3.6	4.0	203.6	15.8
2	12/6/11 9:52	12/6/11 10:54	81.4	3.5	3.7	204.1	15.9
3	12/6/11 11:20	12/6/11 12:22	82.0	3.3	3.4	203.7	15.9
AVERAGE			82.1	3.5	3.7	203.8	15.9
	% of Full Load		91.2%				

Sootblowing occurred from 8:45-8:53 AM